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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/782,618	02/13/2001	John M. Garrett	1600.65221	9752

7590 08/14/2003

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EXAMINER

WILLE, DOUGLAS A

ART UNIT PAPER NUMBER

2814

DATE MAILED: 08/14/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/782,618

Applicant(s)

GARRETT, JOHN M.

Examiner

Douglas A Wille

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 May 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11 and 22-31 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-11 and 22-31 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.
2. Claims 4 and 25 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
3. Claim 4 refers to a section that is rounded in section. Does this mean that the silicon wafer is a round wafer or does it mean that is the cross section shown in the drawings the edge is rounded?
4. Claim 25 refers to surrounded and it appears that rounded is meant. If so claim 25 has the same problem that claim 4 has.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1 – 3, 5, 7 – 11, 22 – 24, 26 and 28 – 31 are rejected under 35 U.S.C. 102(b) as being anticipated by Gotzenbrucker et al.
7. With respect to claims 1 and 22, Gotzenbrucker et al. show (see cover Figure and column 6, line 4 et seq.) a semiconductor substrate which is n-type with a surface layer which is p-type and heavily doped (column 1, line 15) which has a tapered depression that varies smoothly and

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the junction is exposed and a rim of material remains at the edge of the wafer. Note that the abrasion limitation carries no weight in a claim drawn to a device.

8. With respect to claims 2, 3, 23 and 24 the substrate is a silicon wafer (see abstract).
9. With respect to claims 5 and 26, the wafer is doped to high concentration at the surface and lower concentration in the body with the means of doping carrying no weight in claims drawn to a device.
10. With respect to claims 7 – 9 and 28 – 30 the range of angles shown is 1 – 7 degrees (see abstract).
11. With respect to claims 10 and 31, the body is n- type and the surface layer is p-type.
12. With respect to claim 11, electrode 2 is connected to the n-region which forms a device.

Claim Rejections - 35 USC § 103

13. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

14. Claims 6 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gotzenburger et al.
15. Gotzenburger et al. do not show how the chip is separated but it clearly must be separated and since it is shown that there are problems with separation in the ditch (see Figure 12 and column 1, line 15), it would be obvious to separate the device at a region beyond the ditch.
16. Claims 4 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gotzenburger et al. in view of Driscoll.

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17. Driscoll shows a semiconductor device with an angled surface and shows that the sharp edge should be rounded to prevent cracks (see Figure 4 B and column 7, line 45). It would have been obvious to round the edge after separation to avoid cracking.

18. Claims 1 - 3, 5 - 11, 22 - 24, 26 - 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gotzenburger et al. in view of Collumeau et al.

19. With respect to claims 1 and 22, Gotzenburger et al. show (see Figure 2 and column 1, line 65) a device with a moat which has disadvantages because of the narrow ditch. Collumeau et al. show a method of forming a shallow v-slot (see Figure 7 and abstract) where the v-slot is formed by abrasion with a tool or sandblasting (page 7, 2nd and 3rd paragraphs) where the taper varies smoothly. It would have been obvious to use the Collumeau et al. technique in the Gotzenburger et al. device to avoid the problems shown.

20. With respect to claims 2, 3, 23 and 24 the substrate is a silicon wafer (see page 6, line 26).

21. With respect to claims 5 and 26, the wafer is doped to high concentration at the surface and lower concentration in the body (see Figure 6) with the means of doping carrying no weight in claims drawn to a device.

22. With respect to claims 6 and 27, Gotzenburger et al. do not show how the chip is separated but it clearly must be separated and since it is shown that there are problems with separation in the ditch (see Figure 12 and column 1, line 15), it would be obvious to separate the device at a region beyond the ditch.

23. With respect to claims 7 - 9 and 28 - 30 the range of angles shown is < 6 degrees (see abstract).

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24. With respect to claims 10 and 31, the body is n- type and the surface layer is p-type.
25. With respect to claim 11, electrode 2 is connected to the n-region which forms a device.
26. Claims 4 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gotzenburger et al. in view of Collumeau et al. and further in view of Driscoll.
27. Driscoll shows a semiconductor device with an angled surface and shows that the sharp edge should be rounded to prevent cracks (see Figure 4 B and column 7, line 45). It would have been obvious to round the edge after separation to avoid cracking.

Response to Arguments

28. Applicant's arguments filed 5/28/03 have been fully considered but they are not persuasive.
29. Applicant argues that the references do not show a planar slice of semiconductor where the face is removed by abrasion in a smooth fashion. First, abrasion carries no weight in a claim drawn to a device. Second, Gotzenbrucker et al. show an etching process which will produce a smooth surface.
30. Applicant argues that the etching technique will not produce the same surface as abrasion but, first there is nothing in the specification that could distinguish the two and second, the etching step will produce a smooth profile, which is what is claimed.

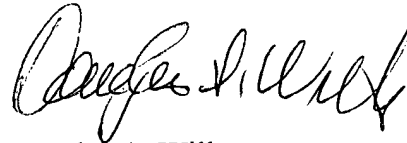
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Douglas A Wille whose telephone number is (703) 308-4949. The examiner can normally be reached on M-F (6:15-2:45).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael Fahmy can be reached on (703) 308-4918. The fax phone numbers for the

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organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

A handwritten signature in black ink, appearing to read "Douglas A. Wille". The signature is fluid and cursive, with the first name "Douglas" being more prominent.

Douglas A. Wille
Primary Examiner

August 5, 2003